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CHAPTER 2

of a series on

STRUCTURAL SLATE

BASIC SPECIFICATION

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THE STRUCTURAL SLATE COMPANY

PEN ARGYL, PENNSYLVANIA

Representing the majority of the Producers in the
PENNSYLVANIA SLATE DISTRICT

Compiled by the **Structural Service Bureau** *Cooperating with*
the Producers and D. KNICKERBACKER BOYD, Architectural Adviser
and Structural Standardist

This Publication, bearing date of May 1st, 1920, is of the Standard 8 1/2 x 11 size recommended by the American Institute of Architects, and is intended for the Files of Architects, Engineers and Constructors

PREFACE

The majority of the producers of Structural Slate in the several sections of the far-famed Pennsylvania District are organized as the Structural Slate Company with combined production, milling and delivery facilities.

This organization realizes the difficulty of preparing a standard, or Basic Specification, that will apply to varying conditions in all parts of the country and meet the requirements, needs and wishes of all architects and owners.

But in the desire to establish methods of procedure based on fullest understanding of the versatility of this product of nature, the Structural Slate Company, with its Architectural Advisor and Structural Standardist, and with the co-operation of architects throughout the country, now offers the following Basic Specification. This will afford the basis of securing equitable conditions in estimating, compliance with established commercial methods of production and accepted good practice in installation as most generally applicable to all localities and needs.

The Company also hopes that this specification, together with any modification that may be made by individual architects or others, will result in the most advantageous use of Structural Slate from the standpoint of the architect and the industry, as well as of the owners and occupants of all buildings where slate may be put to any one of its diversified uses.

Wherever faint lines, or words within parenthesis occur in the specification, they are intended to indicate alternates, additions, or suggestions for consideration, and should be filled in, altered or eliminated to suit any particular instances.

Throughout the specification, notes are introduced as to paragraphs which should be considered for insertion under the various trades concerned with other branches of building construction.

In connection with the installation of slate work, as with any other material, it is essential, in the interest of all concerned, that proper provisions should be made in the construction of new buildings, or in preparing existing structural features, to furnish suitable foundations and backgrounds. All precaution should be taken to overcome shrinkage and obviate settlement. Hence, suggestions for taking care of some of these matters are placed at the end of this specification under "Preparatory Work."

CHAPTER TWO

of a series on

STRUCTURAL SLATE

ESSENTIAL INFORMATION

Characteristics of Slate:

- (a) As stated in "*Mineral Resources of the U. S.*," issued by the U. S. Geological Survey, and referred to more fully, together with characteristics and finishes of slate, in Chapter I of this Series, the slate production of the United States is divided into the two classifications, "Mill-Stock" and "Roofing." The former, which is also known as Structural Slate, "requires a finer, more even-grained, and more compact material than roofing slate, and a material with a smooth cleavage surface."

Color:

- (b) The "Mill-Stock" of commerce in the Pennsylvania District, which in its natural state is a dark, blue-gray color, has been called "black" slate, because of its appearance as usually finished with oil.

Grading:

- (c) While Structural Slate is produced in but one quality, there are two gradings, known as Clear Stock and Ribbon Stock.



Two slabs of "Ribbon Stock," the larger about 2'-6" x 4'-6", the smaller about 1'-0" x 4'-0", photographed outdoors



A "close-up" of the larger slab, which contains both dark and light ribbons

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Ribbon:

- (d) This is the grading most commonly used because it represents the "run of the rock," as about 80% of the natural slate has ribbons in it.

Clear:

- (e) This represents the remaining 20%, which is approximately the greatest amount which can be cut from the beds between separated ribbons.
- (f) The foregoing illustrations show the appearance of ribbon stock, which, naturally, varies indiscriminately, selection for ribbons never being made. Clear stock is, of course, the same color throughout, without the veinings.
- (g) The ribbons themselves do not detract in the slightest degree from the wearing qualities and usefulness of mill stock, and there is a constantly growing inclination to utilize ribbon stock for economical reasons and as a true conservation measure, as well as to so finish it as to show the ribbons, for the distinctive and characteristic appearance of these veinings.
- (h) The limited amount of material resulting in "clear" is cut especially to produce stock for use in certain places where the elimination of the veinings, known as "Ribbons," may seem desirable from the viewpoint of appearance.
- (i) In this connection, unless emphasis is laid upon light oiling, it should be borne in mind that after pieces of slate, whether clear or ribbon, have received the commercial oiled finish as most frequently applied, the effect will be practically the same as to uniformly dull blackish appearance. Only in the case of some stair treads, water-flushed backs of urinals, some floors, and of slate used in similar locations, has it been customary to leave the surface unfinished.
- (j) Specifications sometimes call for the end, or exposed slab or slabs, and all stiles to be clear stock, and for the remaining slabs and the partitions, forming all intermediate enclosures, to be of ribbon stock. The usual practice, however, is to have all of the slate in any given room or space, or place, either all clear or all ribbon stock, which simplifies sorting, shipping and installation.

Relative Costs:

- (k) The waste in cutting to eliminate the ribbons, with the consequent additional labor and other production costs involved, causes the clear grade to be listed at an increase in value over ribbon stock of from about 25% to 30%, the relative prices being quoted on page 8 of Chapter I of this Series, with other data, including weights.

Surfaces and Finishes

- (l) The commercial surface of mill-stock, or structural slate, is known as "standard sand-rubbed" finish. In certain instances, such as for electrical uses and for some sanitary purposes (or all, if desired), this finish is given a further surfacing, resembling a polish, known as "honed" finish.
- (m) The progressive stages in finishing Structural Slate are described in Chapter I of this Series, pages 5 and 6, and are illustrated at actual size, with the closest possible precision of photo-mechanical processes.

Standard Details:

- (n) The attention of architects and users of Structural Slate for sanitary purposes is directed to the "Specifications for Plumbing Fixtures, etc., for the Treasury, War and Navy Departments, issued by the Board on Uniform Plumbing Specifications, March 1, 1916," which may be obtained from the Superintendent

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of Documents, U. S. Government Printing Office, Washington, D. C., at a cost of 75c. These consist of 146 pages and 52 plates of plumbing fixtures, many of them illustrating Enclosures and Stalls for Water Closets, Shower Baths, Bath Tubs and Urinals. The plates contain plans, elevations, sections and other details, which, with their descriptions and dimensions, will be found invaluable for referring to by plate numbers and pages, in connection with specifications for slate work.

- (o) The same will be found true of the illustrations, perspective drawings, standard details and descriptions of the Pyramid Brand Slate fixtures in the subsequent chapters of this series on Structural Slate. These will also illustrate in detail all the Government fixtures before described and will include, as a matter of completeness and service, all metallic fixtures, fittings and parts necessary for erection and operation, as standardized by the Structural Slate Company.
- (p) Pending the completion of the Series the Company's present illustrated "Preliminary Catalogue" will be found helpful for reference and specification purposes.

Specialized Requirements:

- (q) All slate and other parts, which this organization of producers has standardized, are subject to immediate delivery. This fact, however, is not to be construed as placing limitations upon the size or type of slate fixtures which can be produced on short notice to meet all space requirements or other variable conditions.

Sizes and Constructional Data:

- (r) As stated on page 8 of Chapter I, where the cost is given with respect to its increase in proportion to the sizes of slate slabs, "those familiar with the quarrying of natural slate products know that it is more difficult to extract and finish units of large size than those of comparatively small dimensions."
- (s) The producers, therefore, in the interest of economy and conservation, but with due consideration for all sanitary requirements, standardize upon the sizes of slabs most practicable for their respective uses. Where sizes exceed those approximated below, slabs are furnished with joints as referred to in Par. 11.
- (t) **TOILET ENCLOSURES:** Partitions and ends, one piece, height 5' 0", if on standards; 6' 0", if from floor; length from 2' 4" to 5' 0" according to type. Backs, one piece from floor to top line of partitions and from partition to partition with concealed joint back of each. Floors, up to full size of each enclosure.
- (u) **BATH ROOM OR TOILET ROOM ENCLOSURES:** Height 6' 0", if from floors; width of each piece 4' 0" to 5' 0". Floors, from small jointed slabs up to 5' 0" x 6' 0".
- (v) **SHOWER BATH ENCLOSURES:** One slab from corner to corner in each case for standing pieces and one slab for each floor. Height, as per paragraphs 24 or 29.
- (w) **URINALS:** Stall type—partitions, one piece each—backs one piece each jointed behind each partition. Open face type—backs in pieces approximating 4' 0" to divide, as nearly as possible, equally into the space lengths with joints lapped, not butted, and practically invisible, packed with waterproof material as in Paragraph 38. Heights, 4' 6" or 5' 0".
- (x) **COVERED AND OTHER BASES:** Wherever especially required or specified, coved bases in slate are furnished, but as must be apparent, the labor involved and the wastage necessitated to cut away material on a piece even of the sectional area of 6" x 3" to get a 2" cove is considerable. It is therefore recommended that where slate floors join slate bases or sides and coves are desired, that the cove be cut out of a 3" piece for a 2" radius, or less in proportion, and that where floors are other than slate, the cove be formed of cement, tile or other flooring material used.
- (y) **CONTACT WITH FLOORS:** Wherever slate bases or slate slabs in contact with floors are furnished without coves, they will be supplied long enough to extend 1" into the floor, unless otherwise specified.

BASIC SPECIFICATION FOR STRUCTURAL SLATE WORK

GENERAL CONDITIONS: (See Paragraph 15 for abbreviated form)

- (1) Furnish all labor, materials, tools and appliances necessary for the execution and completion of the work in accordance with this specification except as the same may be modified in any way by the architect's drawings or specifications, in which case the architect's drawings and specifications shall govern.
- (2) The General Conditions of the specification written by the architect are hereby made a part of this Basic Specification and of the contract for the Structural Slate work.
- (3) **WORK INCLUDED:** For extent of work, and for the grade and finish of Structural Slate, see the architect's drawings and specifications—and schedule, if any is furnished.
- (4) **ACCEPTANCE OF PREPARATORY WORK:** It shall be the duty of the Structural Slate contractor before beginning any of his work to examine all floor and wall construction and any other supports for his work provided by others, and satisfy himself that everything is in proper condition to receive his work. The architect shall be notified by the Structural Slate contractor in writing of any exception he may take to such construction. Failure to do so shall constitute acceptance of the construction by the Structural Slate contractor as suitable in all ways to receive his work.
- (5) **SAMPLES:** If so required, typical samples, each marked as to grade and finish of slate proposed to be used, shall be submitted to the architect for approval, and left with him, before material is ordered.
- (6) **QUALITY AND FINISH:** All slate hereafter specified shall be dark blue-gray (black if oil finished) in color, hard and non-absorbent, whole, sound and free from irregularities in production or defects in manufacture, and of the commercial grading known as Ribbon Stock, except where Clear Stock may be specifically called for, or is customarily furnished.
- (7) All slate used shall be branded with the trade-mark "PYRAMID," exposed surfaces shall be smooth and free from depressions, loose pieces, cracks, or chipped edges, and all shall be left in true alignment and in every respect thoroughly neat and satisfactory.
- (8) All exposed surfaces, unless honed finish is specifically called for, shall have standard sand-rubbed finish.
- (9) After complete erection and pointing, every piece of slate, except water-flushed backs of urinals, floors or parts of stairways noted, shall be finally treated with raw linseed oil, thinned with turpentine, unless otherwise specifically mentioned, and all shall be left clean and complete.
- (10) **ERECTION:** Each piece of standing slate against any wall or partition shall be properly backed up at the edges or joints with cement mortar or plaster of paris, according to the space, and anchored in place in such manner as to insure its remaining firm and rigid. No piece to have less than two anchors, which shall be (galvanized, or brass, or bronze), so placed as to be concealed, and where of wire, not less than No. 12, W. and M. gauge.
- (11) Where space back of slate against masonry walls is more than 2", brick in cement mortar shall be applied back of all joints. Any intermediate joints necessary in slate slabs shall be of the kind specified for the corner or abutting joints in the same piece of work and thoroughly filled with the same packing material; if showing, the joints must be true, close, and smooth.
- (12) All slabs, partitions, stiles, curbs, bases, treads or other pieces of slate shall be erected, fastened together or secured in place in a first-class manner and left rigid and complete, to the satisfaction of the architect or his representative.
- (13) Joints or external angles shall be made on the side least exposed to view. All external angles and all exposed edges or corners shall be slightly rounded, unless otherwise shown on drawings, or specified. The contractor for slate shall do any cutting or drilling of slate for all other trades, and for anything that is to be connected or attached to slate.
- (14) Before any work is placed in the mill, two copies of shop or setting drawings shall, if required by the architect, be submitted to him for approval of the general principles involved in construction. Such

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approval, when given, with any corrections required, unless taken exception to by the contractor in writing, shall not relieve the contractor of obligations as to rigidity of construction, correctness of sizes and measurements, or other matters pertaining to his contractual relations or to any guarantee.

Abbreviated General Conditions:

- (15) *NOTE: As this Chapter No. 2 is being given wide circulation among architects and slate contractors, and is copyrighted by and registered with the Structural Service Bureau, it is suggested that the brief form indicated by Paragraph 16 be used wherever desired.*

GENERAL CONDITIONS:

- (16) The General Conditions, Paragraphs 1 to 14 inclusive, as printed in Chapter No. 2 on Structural Slate, copyrighted by and registered with the Structural Service Bureau of Philadelphia, bearing the date of April 15, 1920, are hereby made to constitute the General Conditions of this specification.

CLOSET, TOILET AND OTHER ENCLOSURES:

- (17) Furnish and install complete, wherever shown on drawings, all closet, toilet and other enclosures, of sizes and dimensions indicated. Thickness of slate, heights from floors of backs, sides and partitions (and front stiles from floors), and metal supports, where slate does not start from floor, the clamps, braces, rods or other metallic devices or trimmings shall be in accordance with details, notes and descriptions in (here refer to Plate No. and Page No. in the U. S. Government Specifications [Par. (n)] or Pyramid Catalogue [Par. (p)] or in lieu of either, describe fully and provide especially that no coved slate base is to be used unless it is desired—at the increase in expense—to have same, in which case use Paragraph 18.)
- (18) (Wall slabs, ends, backs or partitions, which start from floors, are to have coved bases and floor borders as shown in U. S. Government Specifications [Par. (n)] or Pyramid Catalogue [Par. (p)] Plate No. _____ Page No. _____)
- (19) All joints shall be butted and set with plaster of paris, pointed as may be necessary with same material, colored with lamp-black, except any joints occurring in or at floors, which shall be made water-tight with a full packing of glycerin and litharge.
- (20) *NOTE: The floors, other than slate coves, if used (as per Par. 18) and other than slate floor work, if used (and specified here) should be called for, together with all floor foundations under the respective headings elsewhere in the specifications. If coved slate bases are omitted, it is suggested that coves may be specified in connection with the floor materials other than slate.*
- (21) Doors (if any) will be supplied and hung by another contractor, but the contractor for slate work is to furnish all hinges, catches and locks and other hardware, including hooks (and toilet accessories), and set all that come in contact with slate. All these shall be (in accordance with U. S. Government Specifications [Par. (n)], or Pyramid Catalogue [Par. (p)] from which make selections and state kind and finish).
- (22) *NOTES: Specify that any wood doors are to be furnished by the millman, hung by the carpenter and finished by the painting contractor. If hooks are to be attached to wood doors, eliminate hooks from Paragraph 21 and specify under Hardware.*
- (23) *In the case of any alteration or separate installation where there is little if any other millwork, the doors may be readily specified to be furnished by the slate contractor, the manufacturers being accustomed to furnishing and setting complete equipments of this kind as a matter of service.*

SHOWER BATH ENCLOSURES:

- (24) For single shower stalls, dressing-room enclosures, or ranges of showers, resting on masonry floors topped with cement or material other than slate, specify as in Paragraphs 17, 18, 20 and 21, substituting for Paragraph 19 the following Paragraph 25:
- (25) All joints shall be butt joints, made water-tight with a full packing composed of glycerin and litharge, or an approved water-tight cement.

Slate Floor Type, Masonry Construction:

- (26) Where finished floors are to be of slate, setting on masonry under floors, follow Paragraphs 17, 21 and 25, and specify in addition a countersunk slate slab for each shower, not less than 2" thick, uniformly sloped to the drain outlet, with joint between the floor slabs and floor drain to be made water-tight with same packing as in Paragraph 25. If one drain serves two stalls, floor joint is to be lapped and packed. Floors in dressing rooms to be 1½" thick, not countersunk. If shower stalls are to have curbs at front, specify same and give height and thickness.

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Tile Floor Type, Masonry Construction:

- (27) Where floors are to be of vitreous tile, specify a combination coved base of tile ($\frac{3}{8}$ " to 2" radius) under all side and back slate slabs, and at front curb. All slate to be bedded and jointed as per Paragraph 25. The coved base and the kind, shape and size of other tile, with its laying and under floors, to be elsewhere specified.

Slate Floor Type, Wood Construction:

- (28) **NOTE:** For shower baths above basements, in buildings of wood-joisted construction, specify as in Paragraphs 29, 30 and 31, which require no lead pan. For alternate to this method, requiring lead pan, see Paragraph 34.
- (29) All enclosures for shower baths and adjoining dressing rooms shall be of sizes shown on drawings; sides and backs of slate slabs, 6' 6" high and 1" thick; front stiles and curbs, $1\frac{1}{8}$ " thick; floor slabs in shower stalls not less than 2" thick, countersunk, and in any dressing rooms $1\frac{1}{8}$ " thick, not countersunk.
- (30) The backs, sides, front stiles and curbs shall be rabbeted into each other and into the floor slabs with a full width "break-proof" rabbet, in accordance with "Pyramid" Standards. Sides or backs against the walls shall not be attached to walls, unless with a sliding anchor, to allow for equal settlement. All joints shall be made water-tight, with a full packing of glycerin and litharge or approved waterproof cement, and all slabs shall be secured together and to stiles with not less than two nickel-plated brass standard angle clamps or knees.
- (31) Across the front of each shower, passing through and fastened to nickel-plated brass standards, is to be placed a $1\frac{1}{8}$ " outside diameter nickel-plated brass tubing No. 20 B. & S. Gauge, securely bracing all standing slate.
- (32) **NOTES:** Follow Paragraphs 21, 22 and 23 as to doors, hooks and accessories, where dressing rooms occur or where doors are to be placed at shower stalls. If metal doors or plate glass are desired specially provide for same.
- (33) Where cotton ducking curtains are to be used, specify same to be furnished by slate contractor (to hang 3" below top of curb) together with all necessary brass snap hooks and grommets.
- (34) **AN ALTERNATE TO PARAGRAPHS 29, 30 AND 31:** Is to specify butt joints instead of rabbeted, and to provide a 3-lb. sheet-lead pan soldered tight to floor drain and turned up and folded, not cut, and soldered at corners, concealed with slate base outside, as illustrated in U. S. Government Specifications [Par. (n)]. Pans so used should be drained to basement and so specified under Plumbing.
- (35) **NOTE:** If any of the slabs indicated in Paragraph 30 are rigidly fastened to walls, instead of being left free-standing a lead pan should be specified under the floor there also.

URINALS:

- (36) **TYPES:** Urinals are of three types and several varieties: (a) Open-face with slate back, ends, floor and gutter; (b) Stall type with slate back, ends, floor and gutter and with partitions either starting from slate floor or supported on metal standards; (c) Stall type similar to (b), but without gutter and with floor of slate or same materials as room floor, intended to receive porcelain bowls. See "Essential Information," Paragraph (w), for data on sizes and jointing.
- (37) **NOTE:** The following specification may be used, with such alterations as are necessary to suit the type desired, which alteration will be slight except in the case of the sloping back type, requiring special metal supports, or the top water-trough type, which eliminates the perforated pipe or fan spreaders. For these latter two types follow detail drawings on Sheet No. 2, Sweet's Architectural Catalogue, Fourteenth Edition, Page 461.
- (38) Wherever shown or noted on the drawings, furnish and install slate urinals, or stalls complete. (If the slate for urinals is to have honed finish instead of the standard sand-rubbed finish, so state.) The back, ends, floor (and partitions) to be of thickness, sizes and arrangement shown on Plate No. (—) of U. S. Government Specifications [Par. (n)] or Pyramid Catalogue [Par. (p)] and of the following heights (—). Joints to be made watertight with full packing of litharge and glycerin or approved waterproof cement.
- (39) Furnish all nickel-plated clamps (and standards) and all metal and other parts necessary for erection and operation (except bowls and tanks), including nickel-plated brass perforated wash-down pipes (or fan spreaders) with loose key stopcocks and nickel-plated brass waste strainers in the slate gutters, which gutters are to slope uniformly toward the center (or end) all ready for plumber to make supply and waste-pipe connections. Promptly furnish plumber with all "roughing-in" measurements.

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- (40) **NOTES:** If urinal floor slabs and gutters set on wooden joists provide under Carpenter Work how preparations shall be made for receiving cement foundation, and in any case provide for such foundations under Cement Work.
- (41) Under Plumbing Work call for bowls, if to be installed, and in any case for supply and drain connections to be made to the metal urinal fittings furnished with slate work and wherever ventilated back with slate top type of urinal is used, call for metal vent pipe to be connected to opening to be left in slate top or end.

STAIRWAYS:

All Slate Type with Slate Strings:

- (42) All stairs and landings or platforms between masonry walls where shown or marked for slate are to be furnished and set complete with slate floors, risers and treads and slate strings, in accordance with "Pyramid" Standards.

(Thickness of slate, method of securing strings, construction details, etc., are so dependent upon width of stairs, lengths of runs, and other features, that the Structural Slate Company's Service Department will be glad to advise concerning separate installations of this all-slate type of stairs.)

Slate Stairs on Concrete Supports:

- (43) Where either slate treads or slate treads and risers are set on runs, landings or platforms of reinforced concrete, follow Paragraphs 44, 45, 46 and 47, providing for wall strings of slate, if desired, and for returns or finish at any open ends and specify the slate to be bedded in, or backed with, cement mortar from $\frac{1}{2}$ " to $\frac{3}{4}$ " thick, composed of one volume of Portland cement and two volumes of well-graded, clean sand.

Slate Treads and Risers, with Metal Supports:

- (44) All stairs constructed between steel channels or other metal work are to have slate landings, platforms, risers and treads. Risers 1", landings, platforms and treads, $1\frac{1}{4}$ ", with slightly rounded edges to nosings, with a total projection of $\frac{3}{4}$ " beyond face of risers. (For stairs in hotels, theatres, subways, etc., where traffic is heavy and for widths of over 3' 6" treads and landings should be from $1\frac{1}{2}$ " to 2" thick, and risers 1".) The risers are to be butt-jointed, with full packing, and not less than two $\frac{1}{4}$ " x $1\frac{1}{4}$ " brass dowels at each joint, to the backs of treads below and to the under front edge of treads above.

- (45) **NOTE:** Where metal risers for stairs are used it should be stated that the same, whether cast or pressed, are to be angled or lipped near bottom for slate tread to slip under, in which case dowels are not required on top flange. The metal channels will form strings for stairs, but if metal is not continued around landings, slate bases should be specified.

- (46) All treads are to be set to incline $\frac{1}{8}$ " from back to front.
- (47) All slate work is to be thoroughly dampened just before laying and each tread is to be thoroughly bedded in slater's cement on all slate risers or supporting angles or metal work, this jointing to be neatly cut back or pointed from the underneath as work progresses. All joints between slate and slate, or slate and metal, to be packed with same cement and pointed front and back.
- (48) All pieces of slate to be standard sand-rubbed on the face and have planed surfaces on the reverse side. Any exposed reverse surfaces to be oiled and all sand-rubbed faces to be left clean without oil.

FLOORS, BASES AND PLINTHS:

- (49) The floors, bases and plinths in (here enumerate) shall be of Ribbon Stock (or Clear Stock, or laid alternating) slate.
- (50) The floor slate shall be 1" thick and about 12" square (or other size desired, and $1\frac{1}{4}$ " thick if over 24") cut in uniform lengths and widths to fit the spaces.
- (51) The bases at all walls and partitions shall be 1" thick (—) high above floors and extending 1" below the floor. (If base is to be coved, specify it to be 6" high, above floor, from 2" stock with 1" radius cove cut on bottom, returned on itself at all openings, and cut with solid returns at all interior and external angles.) All bases to be slightly rounded (or bull-nosed) on top. (Details or specification should indicate whether or not base projects full thickness beyond face of wall finish above.)
- (52) All trimmed openings where bases occur shall have plinths (—) high conforming by beveled or straight-angled faces to the profile of the trims (and of jambs if door is not hung on slate-finished side), in accordance with the detail drawings.
- (53) Saddles, or thresholds of slate, 2" thick, beveled two sides shall be provided at all doors or at openings where floor materials change; the same to be, on the flat surface, the full width of the door or jamb of opening, and, in length to either extend under plinth or return on same.

- (54) **NOTE:** The above contemplates a sand-rubbed floor for interior use. If natural split surfaces of irregular or random sizes, for either interior or exterior use, are desired, so specify, and in any case provide for proper firm and solid foundation in another part of specification. (See Preparatory Work, Paragraphs 74 to 87.)

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- (55) All slate and the concrete bed beneath shall be thoroughly cleaned and drenched with clear water immediately before slate is laid. Spread a full bed of mortar, from $\frac{3}{8}$ " to $\frac{3}{4}$ " thick, composed of one volume of Portland cement and two volumes of well-graded, clean sand, and thoroughly tamp each piece of slate as laid.
- (56) The joints of floors shall be tight butt joints grouted in with cement mortar, colored same as slate (or wide joints with light-colored mortar, pointed, in which case so specify). Leave floors clean and flush and true at all joints, with each piece of slate solidly bedded.
- (57) The bases (whether straight or coved) shall be in pieces of the longest practicable length, thoroughly bedded on cement foundation and against walls, in same mortar as floors, and pointed tight.
- (58) In addition to the cement backing, the plinths shall be held in place by nickel-plated brass, round-head screws into the door bucks. (If concealed screws are desired, state that galvanized screws are to be used with heads countersunk and flushed with "slater's wax.")
- (59) *NOTE:* According to location and intended use, state whether above slate is to be oiled or left unfinished.

WAINSCOTING:

- (60) Where shown or specified, furnish and set slate slabs to form wainscoting (—) high, not less than $\frac{3}{4}$ " thick at edges and in widths between three and four feet to divide with approximate regularity into the various space lengths. Each slab to have (two brass or bronze dowels into base, if any, and) two anchors of brass or bronze into wall at back (or at top if above eye line or covered with mold).
- (61) *NOTE:* State whether wainscot height includes caps, if any, and whether slabs shall be cut long enough to extend 1" into a cement floor, will have a tile or cement cove or a wood scotia, etc. If slate base is desired use Paragraphs 51, 57 and 63.
- (62) Molded top, or wainscot cap, shall be thoroughly anchored into wall and mortared against same, bedded to slabs and be cut true to full size details. Joints in interior and external angles and at all openings shall be cut with solid returns and not mitered.
- (63) All bases, if of slate, to be thoroughly bedded, set and anchored in cement mortar (as specified for floors).
- (64) All butt joints of slabs (and moldings) to be thoroughly backed up with plaster of paris, filled and pointed with same, colored, and left close, neat and true.
- (65) *NOTE:* Under "Plastering" in new work, state that behind all slate wainscot, plaster is to be omitted.

In Existing Buildings:

- (66) For the application of slate wainscots in existing buildings, with or without bases, specify the slabs to be secured through from the face, either with round-head screws or with countersunk screws, concealed with "slate-wax," the screws in masonry to be inserted into expansion sockets or spot grounds and not into wood plugging.

BASES: (Without Slate Floors or Wainscots)

Against Masonry Backgrounds:

- (67) In all halls, corridors, passages or other portions of the building so indicated run a slate base (—) thick and (—) high at each wall or partition, pilaster, etc., same to be — (to complete, refer to Paragraphs 51, 57 and 63).

Against Wooden Backgrounds:

- (68) In other portions so noted (or here specified) run a plain $7\frac{1}{4}$ " x 16" base (or other height as may be required by local ordinance) with slightly rounded top (or bull nose). To be set and applied in same manner as specified for wainscoting under Paragraph (65), except that it shall be screwed directly into wood supports.

OTHER USES:

Slate laundry trays, sinks and sink tops, lavatory tops, W. C. slabs, radiator recesses and bases, vats and tanks and other fixtures in which slate forms a part of the plumbing, heating or other installations are not here included and will be referred to elsewhere in connection with such installations.

The same applies to slate used for laboratory and other table tops, for shelving, for interior window sills, exterior cornices and other purposes which will be taken up separately.

ELECTRICAL USES:

The National Electrical Code, the standards of the Underwriters' Laboratories and the data of Manufacturers of Switch Boards, Panel Boards, etc., will naturally govern specification requirements for slate in all forms of electrical equipment.

CHAPTER 2 OF A SERIES ON STRUCTURAL SLATE

PREPARATORY WORK FOR SLATE WALL AND FLOOR SLABS

The following paragraphs refer to items usually not made a part of the work of the structural slate contractor, and are here presented as suggestions or reminders, in connection with other specifications, or parts thereof, for the work of the various building trades. The Standard or Basic Specification presupposes that the following structural requirements have been complied with by other trades.

FOR SLATE USED VERTICALLY:

- (69) **MASONRY BACKGROUNDS:** Walls or partitions of brick, hollow tile, concrete, or other masonry afford excellent backgrounds for slate surfacing, either as parts of enclosures, or as wainscots, bases, etc. It is not necessary to insert plugs or grounds in any such walls, as the specification for slate work requires that the slate-setter drill, or otherwise provide, for his own anchors. Mortar or plastering is unnecessary on masonry backgrounds, as the slate-setter's backing up and jointing will take care of inequalities in these surfaces.
- (70) Where shower enclosures are supported on wooden joists, all vertical slate features should be independent of the walls or partitions or have sliding anchors to allow shrinkage in the joists to permit all slate to settle equally, and avoid the opening of joints which might otherwise result.
- (71) Such opening of joints in the case of wainscots, or wall slabs, where wood joists occur, may be avoided by several means, such as bases, coves, wooden scotias, cutting the finished floor against the slabs, and otherwise.
- (72) **WOOD OR METAL BACKGROUNDS:** On wood and metal studs or furring back of slate, it is desirable that lathing and plastering should be placed.
- (73) Wood studs should be not less than 2" x 4", and spaced not over 16" on centers, braced at least once in their height with 2" x 4" horizontal bracing.

FOR SLATE USED HORIZONTALLY:

- (74) **MASONRY FLOOR CONSTRUCTION:** The tops of all structural tile or concrete floor construction should be kept down below the finished floor line to the depth required by the thickness of the concrete bed and the slate floor slabs and setting-bed to be used.
- (75) **STEEL BEAMS:** The tops of any steel beams or girders should be kept down at least 3" below the finished floor line, and should be covered with roofing slate, sheet metal or waterproof paper to prevent adhesion of the concrete bed.
- (76) **CONCRETE BED ON MASONRY FLOOR CONSTRUCTION:** The top of floor construction should be swept clean, well drenched with water and a 2" thick concrete bed of stone, sand or cinder concrete laid, ready to receive the slate contractor's setting-bed.
- (77) Where any pipes are to be run in the concrete bed, the floor construction should be lowered, so that the top of any pipe will not come above the top of the concrete bed.
- (78) **CONCRETE BED ON EARTH OR FILL:** When slate slabs or floors occur in connection with earth, cinder or gravel fill, the fill should be thoroughly puddled and tamped, and a concrete bed not less than 3" thick provided. The bed should be of crushed stone, slag or gravel for outside work, and may be of clean cinders for inside, mixed with cement and sand in accordance with good practice, ready for the setting-bed of cement mortar to be furnished and applied by the contractor for slate work.

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- (79) **REINFORCEMENT:** Reinforcing metal, where required for concrete beds under slate floors, should be from 2" to 3" mesh No. 16 gauge expanded metal, or 3" x 8" No. 8 and No. 10 gauge reinforcement.
- (80) Reinforcement should be placed about $\frac{3}{4}$ " above the bottom of the concrete bed, and where more than one width or length is required, be lapped not less than 6". (See paragraph 87.)
- (81) **WOOD FLOOR JOISTS:** The tops of wood floor joists, wherever possible, should be lowered to the level required to provide space for a continuous concrete bed or foundation to receive the slate and the slate contractor's setting-bed.
- (82) Where floor joists cannot be lowered to the required level, the tops of the joists should be beveled off to a sharp edge, until the top is at least 2" below the finished floor.
- (83) Spans of joists from 6' 0" to 10' 0" should be bridged with one row of cross bridging, and spans of 10' 0" and over with one row to each five feet. Bridging should be not less than 1" x 3"; should be accurately cut to fit, and securely nailed at each end with two 8-penny nails.
- (84) **WOOD UNDER-FLOORING:** On top of the joists, if the joists have been lowered, should be laid a flooring of 1" by not over 6" wide boards placed about $\frac{1}{4}$ " apart* and securely nailed to each joist.
- (85) To the sides of the joists if the joists have not been lowered, should be securely nailed 1" by not less than 2 $\frac{1}{2}$ " cleats at the depth required. Between the joists set 1" by not over 6" wide boards laid about $\frac{1}{4}$ " apart* and securely nailed to the cleats.
- (86) **CONCRETE BEDS ON WOOD JOIST CONSTRUCTION:** The wood under-flooring and tops of joists, if joists have not been lowered, should be covered with a layer of waterproof paper, weighing not less than 11 lbs. per 100 sq. ft. For floor areas of 100 sq. ft. or less, the concrete bed if of stone, gravel, or coarse sand concrete, should be 2" thick, or if of cinder concrete, 3" thick. For areas of over 100 sq. ft. the concrete bed, if of stone, gravel or coarse sand concrete, should be 2 $\frac{1}{2}$ " thick, or if of cinder concrete, 3 $\frac{1}{2}$ " thick.
- (87) For floor areas of more than 100 sq. ft. the concrete bed should be reinforced. (See Paragraphs 79 and 80.)

*If laid tight, the moisture in the concrete may swell up and buckle the floor boards.

Pending the completion of its Series of Chapters which will illustrate and describe, separately and in detail with specification paragraphs, each kind of slate installation, the Structural Slate Company trusts that this specification, in connection with "Uniform Specifications" of the U. S. Government and with its present Catalogue [see Paragraphs (n) and (p)] may present opportunity for use, suggestion and comment.

Address any communications, or requests for additional copies—which will be freely furnished—to



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